

Patent claims

1. Method for selecting frequency channels in a data transmission method that uses a frequency hopping method, comprising:

5 determining an existence of interference on a frequency channel by detecting multiple erroneous transmissions in the frequency channel;

10 eliminating the frequency channel from a frequency hopping sequence if a determination is made that interference exists thereon;

15 measuring a strength of external signals within a frequency range of an eliminated frequency channel; and reinserting the frequency channel into the frequency hopping sequence if the measured strength is below a prescribed threshold value.

2. The method of Claim 1, wherein interference in the frequency channel is determined if a number of erroneous transmissions exceeds a number of error-free transmissions by a prescribed threshold value within a predetermined period of time.

3. The method of Claim 2, wherein each frequency channel has a counter associated therewith, and further comprising incrementing the counter upon erroneous transmission and decrementing the counter upon error-free transmission, and determining interference in the frequency channel if the count exceeds a prescribed threshold value.

4. The method of Claim 1, wherein detecting an erroneous transmission comprises using checksums that are added to block-transmitted data at an end thereof.

5. The method of Claim 4; wherein using checksums comprises adding a CRC (Cyclic Redundancy Check) code to each data block at the end thereof.

5 6. The method of Claim 1, wherein the data transmission method comprises a timeslot method, and measuring the external signal strength comprises measuring during unused timeslots.

10 7. The method of Claim 1, wherein measuring the external signal strength comprises performing a field strength measurement based on the RSSI (Radio Signal Strength Indication) method.

15 8. The method of Claim 3, wherein measuring the external signal strength further comprises decrementing the counter if the measured strength is below a prescribed threshold value.

20 9. The method of Claim 8, wherein the frequency channel is reinserted into the frequency hopping sequence as soon as the count reaches the value zero.

25 10. The method of Claim 8, wherein measuring the external signal strength further comprises setting the counter to its maximum count if the measured strength exceeds a prescribed threshold value.

30 11. A method for data transmission between at least two stations via radio links using the frequency hopping method and the frequency channel selection method of Claim 1.

35 12. The method of Claim 11 wherein the method is based on one of the transmission standards Bluetooth, WDCT, DECT or HomeRF.

13. A method for selecting frequency channels in an adaptive frequency hopping methodology, comprising:
evaluating a channel for interference associated
therewith;
eliminating the channel from a channel hopping sequence if the channel has interference;
re-evaluating eliminated channels; and
reinserting eliminated channels back into the
channel hopping sequence if interference is no longer associated therewith.

14. The method of claim 13, wherein evaluating the channel for interference comprises:
identifying a number of erroneous transmissions on the channel within a predetermined period of time; and
comparing the identified number to a predetermined threshold.

15. The method of claim 14, wherein evaluating the channel for interference further comprises:
identifying a number of error free transmissions on the channel within the predetermined period of time;
and
20 using both the number of erroneous transmissions and the number of error free transmissions to determination whether interference exists on the channel.

16. The method of claim 15, wherein using both the erroneous and error free transmissions comprises:
incrementing a counter each time an erroneous transmission is identified within the predetermined time period;
35 decrementing the counter each time an error free transmission is identified within the predetermined time period;

comparing a count of the counter with a predetermined threshold after the predetermined time period has elapsed; and

5 determining that interference exists on the channel if the count exceeds the predetermined threshold.

17. The method of claim 15, wherein using both the erroneous and error free transmissions comprises:

10 incrementing a first counter each time an erroneous transmission is identified within the predetermined time period;

15 incrementing a second counter each time an error free transmission is identified within the predetermined time period;

generating a ratio based on the counts of the first and second counters after the predetermined time period has elapsed; and

20 determining that interference exists on the channel if the ratio exceeds a predetermined threshold.

18. The method of claim 13, wherein re-evaluating an eliminated channel from the channel hopping sequence comprises:

25 measuring an interference signal strength associated with the channel; and

determining that interference no longer exists on the channel if the measured interference signal strength is less than a predetermined amount.

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19. The method of claim 18, wherein determining that interference no longer exists further comprises:

decrementing a counter if the measured signal strength is less than a predetermined threshold;

35 comparing a count of the counter to a predetermined value; and

determining that interference no longer exists if the count is less than or equal to the predetermined value.